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| 10/530,870 | 01/13/2006 | Marc Uwe Tornow | 052275 | 2261 |
| 38834 7590 11/12/2008 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036 | | | | |
| EXAMINER | | | | |
| GOODWIN, DAVID J | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 2818 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/530,870

Applicant(s)

TORNOW ET AL.

Examiner

DAVID GOODWIN

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2008.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-24 is/are pending in the application.
4a) Of the above claim(s) 24 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 15-23 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/CDC)
4) ☐ Interview Summary (PTO-413)
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____
Paper No(s)/Mail Date _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Regarding claim 16, the phrase "like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 15 through 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krahne ("FABRICATION OF NANOSCALE GAPS IN INTEGRATED CIRCUITS" APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS, NEW YORK, US, vol. 81, no. 4, 22 July 2002 (2002-07-22), pages 730-732, XP001130351) in view of Hutchinson (US 6872971)

1. Regarding claim 15.
2. Krahne teaches a method of making a semiconductor device. Said device comprises a patterned semiconductor hetero structure forming a source drain and gate contacts to build up a hybrid device from the semiconductor base structure (fig 1e). Comprising a material stack of two undoped layers of material A separated by a doped

layer of a different semiconductor layer B the semiconductor hetero structure having a conductive source and drain electrode on the undoped material a (fig 1e) wherein the conductive source and drain electrodes are situated on a selectively etched cleavage plane oriented perpendicular to layer plane and the groove nanogap is bridged. The device further comprises a wire bridging the source and drain electrodes, said wire comprising an organic material. Said devices comprise single electron transistors (fig 1f).

3. Krahne does not teach what the organic component of the nanowire comprises.
5. Hutchinson teaches forming gold nanoparticles comprising DNA oligonucleotides (column 32 lines 15-60).
6. IT would have been obvious to one of ordinary skill in the art to form particles comprising DNA in order to ligand stabilize the gold nanoparticle.
7. Regarding claim 16.
8. Hutchinson teaches that the ligand stabilizing molecules are further functionalized with receptors (column 11 lines 1-20). The device can be used as a sensitive electrical biosensor.
9. Regarding claim 17.
10. Krahne teaches that the doped layer can function as a field effect gate electrode (1e).
11. Regarding claim 18
12. Krahne teaches that the bridging wire exceeds the length of the gap and is terminated (fig 1e).

13. Hutcherson stabilizing molecules that can covalently bond to the source and drain electrodes (column 11 lines 1-20).
14. Regarding claim 19.
15. Krahne teaches that the bridging wire exceeds the length of the gap and is terminated (fig 1e).
16. Hutcherson stabilizing molecules that can covalently bond to the source and drain electrodes (column 11 lines 1-20).
17. Regarding claim 20.
18. Krahne teaches that the bridging wire exceeds the length of the gap and is terminated (fig 1e).
19. Hutcherson stabilizing molecules that can covalently bond to the source and drain electrodes (column 11 lines 1-20).
20. Regarding claim 21.
21. Hutcherson teaches functionalized DNA which can change conductance based on analyte binding to functional groups.
22. The limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does."

Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F. 2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

23. Regarding claim 22.

24. Krahne teaches that the hetero structure comprises undoped AlGaAs for the undoped layers and GaAs for the doped layer (fig 1d)

25. Regarding claim 23.

26. Krahne teaches that the source and drain electrodes comprise PdAu alloy (paragraph 3).

Response to Arguments

27. Applicant's arguments with respect to claim 15 through 23 have been considered but are moot in view of the new ground(s) of rejection.

28. The applicant argues that the prior art addresses a connectivity issue rather a sensor.

29. In response to applicant's argument that the device senses, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

30. Further, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

31. The applicant argues that Krahne does not teach a cleaved plane.

32. Note that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985) and related case law cited therein which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. As stated in *Thorpe*,

- a. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *In re Pilkington*, 411 F.2d 1345, 1348, 162 USPQ 145, 147, (CCPA 1969); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir 1935).

Note that Applicant bears the burden of proof in such cases as the above case law makes clear.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID GOODWIN whose telephone number is (571)272-8451. The examiner can normally be reached on Monday through Friday, 9:00am through 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571)272-1657. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Djg

/Steven Loke/
Supervisory Patent Examiner, Art Unit 2818